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ACUTE NEPHRITIS IN NON-EUROPEAN CHILDREN, WITH SPECIAL REFERENCE TO THE TREATMENT OF HYPERTENSION WITH MAGNESIUM SULPHATE

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Acute nephritis is a fairly common condition in paediatric practice but as far as we are aware no comparable series of the disease in the non-European community in South Africa has been published. The only available literature is a paper by Uys[1] on the pathology of renal disease in the Bantu on the Witwatersrand.

The paediatric out-patient department of the Coronation Hospital deals with children of African, Indian and Coloured (i.e. mixed) descent up to the age of 12 years. The average annual attendance is 65,000, out of which 2,100 patients are admitted to the wards.

The series now reported comprises 83 cases of acute nephritis admitted to the paediatric wards during the period January 1951 - December 1958 (inclusive). The diagnosis was based on the 4 factors: history, oedema, oliguria, and hypertension, in various combinations, as well as urinary findings of haematuria, albuminuria and granular casts in all cases.

Sex, age and race. Of the 83 cases, 45 were males (54%) and 38 females (46%). There were 46 Africans (55%), 30 Coloured (i.e. of mixed descent) (36%), and 7 Indians (9%). The ages ranged from 2 to 12 years, the greatest incidence being at 3 - 5 years (Tables I and II).

TABLE I. CASES BY AGE (IN YEARS) AND SEX

	1 - 2	*2 - 3*	*3 - 4*	*4 - 5*	*5 - 6*	*6 - 7*	*7 - 8*	*8 - 9*	*9 - 10*	*10 - 11*	*11 - 12*	*12 - 13*
Male	—	3	8	6	10	3	4	2	4	2	2	1
Female	—	1	5	8	11	4	3	2	1	2	1	—
Total	—	4	13	14	21	7	7	4	5	4	3	1

TABLE II. CASES BY RACE

	Bantu	*Mixed*	*Indian*	*Total*
Male	24	18	3	45
Female	22	12	4	38
Total	46	30	7	83

Stay in hospital. This ranged from 3 to 68 days, with an average of 3½ weeks (Table III).

TABLE III. DURATION OF STAY IN HOSPITAL (IN DAYS)

	0 - 7	*8 - 14*	*15 - 21*	*22 - 28*	*29 - 35*	*36 - 42*	*43 - 49*	*50 - 56*	*57 - 63*	*64 - 70*	*Total*
Male	3	9	10	10	8	2	3	—	—	—	45
Female ..	2	9	5	7	6	2	—	2	3	2	38
Total	5	18	15	17	14	4	3	2	3	2	83

Predisposing illnesses. In only 40 cases could a history of predisposing illness be elicited. Twenty gave a history of sore throats, 15 of impetigo, 4 of acute otitis media, and 1 of infected burns.

Presenting symptoms. Although oedema and haematuria were the commonest symptoms, not all of the 83 cases presented with them. There were 72 with initial oedema, while only 52 presented with haematuria. Only 43 patients, however, presented with both symptoms together. In 8 cases there was a history of oliguria. Cerebral symptoms as a presenting feature occurred in 22 cases. Other presenting symptoms are shown in Table IV.

TABLE IV. PRESENTING SYMPTOMS

Symptoms		*Number of Cases*
Oedema		72
Haematuria		52
Cerebral symptoms		22
Headache	18	
Vomiting	11	
Drowsiness	6	
Irritability	2	
Convulsions	1	
Blurring of vision	1	
Urinary symptoms		8
Oliguria	8	
Dysuria	8	
Polyuria	4	
Backache	3	
Anorexia		14
Pyrexia		10
Abdominal pain		7
Epistaxis		4
Diarrhoea		2
Dyspnoea		2

Clinical Findings

1. *Oedema.* A history of oedema was given in 72 cases, but on examination this was only found in 67; and of these 3 did not give a history of oedema. This indicates that at least 75 patients had had oedema during the course of their illness.

2. *Hypertension.* This was recorded as being present in any child with a diastolic blood-pressure reading of 10 mm.Hg (or more) above the normal for the corresponding age-group given by Lyon and Kaplan in Nelson's *Textbook of Pediatrics.*[2] On this criterion, 61 cases (73·5%) of whom 32 were males and 29 females, showed variable degrees of hypertension (Table V). Under treatment this persisted for 1 - 29 days (average 7·1 days). Of the 46 African cases 71·7% showed hypertension, and of the 30 Coloured, 70%. All the 7 Indians were hypertensive. Associated with the hypertension were 13 cases in con-

TABLE V. TREATED AND UNTREATED HYPERTENSIVE CASES

Age Groups	Cases	Diastolic BP in mm.Hg								Total
		70 - 80	80 ^	90 ^	100 ^	110 ^	120 ^	130 ^	140 ^	
4 years and under*	All	4	5	2	4	2	3	2	1	23
	Treated	1	2	1	3	1	3	1	1	13
5 - 8 years†	All	2	2	8	8	6	2	2	—	30
	Treated	1	1	6	8	5	1	1	—	23
9 - 12 years‡	All	1	1	—	3	3	—	—	—	8
	Treated	—	1	—	3	3	—	—	—	7
Total	All	7	8	10	15	11	5	4	1	61
	Treated	2	4	7	14	9	4	2	1	43

* Mean normal blood pressure, systolic 85, diastolic 60.
† Mean normal blood pressure, systolic 87 - 95, diastolic 60 - 62.
‡ Mean normal blood pressure, systolic 98 - 108, diastolic 64-69.

gestive cardiac failure, of whom 1 was hyperpotassaemic with complete heart block, dying in uraemia soon after admission. Two were cases of hypertensive encephalopathy with bizarre and changing signs.

3. *Infections.* Acute infections were present on admission in 56 patients — in 36 acute tonsilitis and pharyngitis, 11 impetigo, 5 acute otitis media, 3 pneumonia, and 1 carbuncle of the anterior abdominal wall. One child was found to have pulmonary tuberculosis.

Investigations

1. In all the cases proteinuria, haematuria, and granular casts were found in the urine.

2. The urinary output was measured in every patient. In those showing an initial oliguria the output soon became normal, except in one who was anuric on admission and died in uraemia.

3. The blood urea was measured in 78 cases. In 36 (46%) it was found to be above normal, i.e. above 40 mg. per 100 ml. In all these the blood urea reverted to normal on improvement of the clinical condition.

4. The erythrocyte sedimentation rate was measured in 55 of the children and was found to be raised in 48 (87%).

5. Haemoglobin estimations were carried out in 73 cases. Anaemia was recorded if the level of haemoglobin found was 1 g. per 100 ml. (or more) below the normal given for the corresponding age and sex by Whitby and Britton.[3] On these criteria, 30 patients (41%) were found to be suffering from different degrees of anaemia.

6. Leucocyte counts were carried out in 72 patients. In 39 of these a reading of over 11,000 WBCs per c.mm. was recorded.

7. Serum-protein and serum-cholesterol estimations were carried out in some cases and as the results were all within normal limits, these investigations were not made in the rest of the cases. The actual results in the cases where the estimations were carried out were as follows: Serum-cholesterol estimations were carried out in 35 cases; 8 had levels between 100 - 150 mg. per 100 ml., 17 between 151 - 200, and 10 between 201 - 260 mg. per 100 ml. Serum-protein estimations showed the usual reversal of albumin-globulin ratio which is found in the non-European population, except in 1 case. The albumin-globulin ratio in this case was 4·4 : 3·1 g. per 100 ml.

8. In the 31 cases where throat swabs were taken haemolytic streptococci were isolated on culture in only 2 cases. Other organisms cultured were non-haemolytic streptococci (2 cases), *Streptococcus viridans* (11 cases), *Staphylococcus aureus* (1 case) and *pneumococci* (2 cases). In 13 cases no pathogenic organisms were found.

9. Streptococcal antihaemolysin-O titres were only estimated (in 26 cases) during the latter years of this series. In 16 cases (62%) the titre exceeded 200 units.

TREATMENT AND RESULTS

General Treatment

All cases were treated with bed rest, salt-free and low-protein diet, and a regulated fluid intake for a variable period depending on the clinical improvement. Every case received parenteral penicillin for at least 5 days.

Treatment of Hypertension

Hypertension was treated in cases where it persisted for more than 24 hours after admission, or the blood pressure continued to rise, and in cases with complications (congestive cardiac failure or encephalopathy).

In our opinion the treatment of choice in cases of uncomplicated hypertension is intramuscular magnesium sulphate (0·1 c.c. of a 50% solution per kg. body-weight) given every 4 - 6 hours until the blood pressure readings became normal. These were taken every 2 - 4 hours.

Cases in which congestive cardiac failure is present are treated with digoxin as well as intramuscular magnesium sulphate. The digitalizing dose of digoxin is 0·025 - 0·04 mg. per lb. body-weight for the first 24 hours.

In patients with encephalopathy magnesium sulphate is given by slow intravenous infusion (15 c.c. of a 1% solution per kg. body-weight) over 12 - 24 hours. The blood pressures should be checked every half hour. As clinical improvement occurs, the treatment should be changed to intramuscular magnesium suiphate until the blood pressure has become normal.

The following 2 cases are reported as examples of this regime of treatment:

Case 1

P. J., a 10-year-old Coloured girl was admitted to hospital on 13 September 1956 with a history of headache and vomiting of increasing severity for 3 weeks. On the day before admission she developed generalized convulsions lasting from 2 - 5 minutes without loss of consciousness. There was no history of previous convulsions and no family history of epilepsy.

Examination. On the day of admission the child lay curled up in bed, ill, mentally confused, and irritable. Temperature 99·8°F, pulse rate 100 per minute, respiration rate 24 per minute, blood pressure 180/120 mm.Hg. Further examination negative. The next day peri-orbital oedema and left hemiparesis were noted. The fundi showed vascular spasm. The urinary output during the first 24 hours was slightly diminished. Urinalysis showed marked proteinuria with innumerable erythrocytes, a moderate number of pus cells, and granular and hyaline casts. Blood urea 62 mg. per 100 ml.

Treatment with 1% intravenous magnesium sulphate (3 g. in 300 c.c. of 5% invert sugar) was commenced. Within 30 minutes the blood pressure started to fall and in 5 hours it was 120/90 mm.Hg; the headache had disappeared and the neurological examination was normal, the fundi showing no vascular spasm. After 9 hours' treatment intramuscular magnesium sulphate (5 c.c. of 50% solution 4 hourly) was instituted. No further cerebral symptoms were observed and the blood pressure remained normal. The patient made an uneventful and complete recovery, and was discharged from hospital on 16 October 1956.

Case 2

C.T., a 9-year-old Coloured boy was admitted on 10 March 1957 with a 1 week's history of headache, swelling of the face and black urine.

Examination. On admission the child looked ill, temperature 101°F, pulse rate 100 per minute, respiration rate 24 per minute, blood pressure 180/120 mm.Hg. Peri-orbital, scrotal and ankle oedema were present. There were no neurological signs. Urinalysis showed a marked proteinuria, numerous erythrocytes, a few pus cells, and hyaline and granular casts. Blood urea 49 mg. per 100 ml. Urinary output normal.

Treatment with intramuscular magnesium sulphate (3 c.c. of 50% solution 4 hourly) was started. The following morning the headache was severer and vision was blurred. The blood pressure was then 170/130 mm.Hg. As intravenous magnesium sulphate (6 g. in 600 c.c. of 5% dextrose water) was about to be commenced, the child had a generalized convulsion. The infusion, however, brought the blood pressure under control with dramatic improvement of symptoms, the blood pressure falling to 140/90 mm.Hg within 4 hours. After 8 hours, intramuscular therapy was recommenced for another 2 days with no further rise in blood pressure. The patient was discharged on 13 April 1957 with a blood pressure of 110/60 mm.Hg.

Results

Forty-three of the 61 children who had hypertension associated with their acute nephritis were treated with magnesium sulphate. Forty-one, including 13 with congestive cardiac failure, were treated with intramuscular magnesium sulphate. A good response followed by complete recovery was obtained in every case but one. This case, mentioned above, was admitted with hypertension, congestive cardiac failure, anuria and hyperpotassaemia, and died in uraemia. The 2 cases with hypertensive encephalopathy were treated initially with intravenous magnesium sulphate, with dramatic improvement in the cerebral condition; intramuscular magnesium sulphate was then given until they became normotensive, and eventually they both recovered completely. The duration of therapy in the 41 cases was from 18 hours to 11 days with an average of 4·2 days. The remaining 18 hypertensive cases were not treated with magnesium sulphate because their blood pressure dropped to normal levels on bed rest alone. The 22 non-hypertensive cases in the series recovered completely without any specific treatment.

Socio-economic and racial factors made it difficult to follow up the 82 children who recovered. Amongst those who were seen there were no indications of progression to chronic renal disease.

DISCUSSION

In our series, acute nephritis accounted for 0·4% of admissions to the paediatric wards with a slight preponderance of males over females (Table I). The cases under the age of 7 made up 71% of the series. These figures are similar to those quoted by Rubin.[4]

Hypertension occurred in about 75% of all our cases. It was present in all 7 Indian patients which, although not of statistical significance, may indicate that they are more prone to hypertension in this disease than other races, or that dietary factors, viz. their high protein intake, may play an important part in the aetiology of this complication. Three other Indian cases of acute nephritis, which occurred during 1959 (not included in this series), were also found to have severe hypertension; follow-up has shown them to be progressing to the chronic phase of the disease.

The rise of blood pressure (like its fall) is often precipitous. It usually persists for the first week of the illness, but may continue for weeks before returning to normal levels. If the disease progresses to the subacute and chronic stages the hypertension will become permanent, but this did not occur in our series.

The hypertension is said to be caused by vasospasm following renal ischaemia.[4] The rise in blood pressure represents a compensatory attempt to increase the rate of glomerular filtration.[5]

The possibility that the hypertension may be complicated by encephalopathy and congestive cardiac failure necessitates close observation of the patient with immediate therapy upon detection of either of these complications. Hypertensive encephalopathy is a much more frequent complication in children than in adults.[6] Blackfan and Butler[7] reported an incidence of 8%. Cerebral symptoms occurred in 31·1% of Burke and Ross's cases.[8] In the present series 26·5% showed cerebral symptoms but only 2·4% had encephalopathy. Rubin[4] states that congestive cardiac failure occurs in 20% of cases. In this series 15·7% showed evidence of congestive cardiac failure.

A number of drugs have been employed in the treatment of hypertension in acute nephritis. Magnesium sulphate has been used for many years. It was introduced by Blackfan *et al.*[9] in 1923 and has been widely used ever since. It is most satisfactory in the treatment of hypertensive crises because it has the advantage of increasing the glomerular filtration rate, improving the effective renal plasma flow with a corresponding increase in the renal blood flow in the presence of vascular spasm. When encephalopathic symptoms occur the intravenous is the most useful method of administration,[10-12] because of its action in relieving cerebral arterial spasm.[13] In the presence of oliguria the excretion of the magnesium sulphate decreases, giving rise to toxic effects manifested by slowing of the respiratory rate.[11] It can be counteracted by the intravenous administration of 10% calcium gluconate, but this was not required in any of our cases.

Magnesium sulphate was the drug of choice in all our patients with hypertension which we considered necessitated treatment. The drug was effective in all cases and other hypotensive agents were found to be unnecessary.

Veriloid,[14,15] reserpine,[16] hydralazine,[17,18] reserpine with hydralazine,[19,20] and hexamethonium[19] have all been used in the treatment of hypertension of acute nephritis with variable results. We have had no experience with them.

Conclusion

We have found magnesium sulphate a very effective drug to use in the treatment of hypertension in acute

nephritis. We did not carry out routine control with electrolyte estimations and ECG tracings; nevertheless, none of our cases showed any signs of toxicity, and we recommend it as a safe and useful drug when hypotensive agents are indicated in this disease, provided it is used in the dosage suggested.

SUMMARY

1. Eighty-three cases of acute nephritis in non-European children admitted to hospital over a period of 8 years are analysed.

2. Special reference is made to hypertension, its complications, and its treatment with magnesium sulphate.

3. All cases where it was indicated were treated with magnesium sulphate with good results. No toxic effects followed its use.

4. There was only 1 fatality in the series.

We wish to thank Dr. D. G. Elliott, Medical Superintendent, Coronation Hospital, for permission to publish this report; Dr. H. C. Falcke, senior paediatrician; and Dr. Harvey Cohen, under whose care the cases reported were admitted. We are especially grateful to our friends for much helpful criticism.

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AMPTELIKE AANKONDIGING : OFFICIAL ANNOUNCEMENT

INSURANCE COMPANY MEDICAL AID

At its recent meeting held in Vereeniging on 19 - 21 October 1960, the Federal Council of the Medical Association of South Africa debated the policy of the Association in connection with (1) the approval by the Association of groups administered by insurance companies as medical aid societies, and (2) the advice to be given to members regarding certain cheques on which a code number indicates that the value of the cheque is according to the medical aid tariff of the Association and is 'tendered in full settlement of the gross amount of such account' — these cheques are at present being issued by the South African Mutual Medical Aid Society to medical practitioners.

1. *Approval of Medical Aid Groups Administered by Insurance Companies*

In March 1960, Federal Council took the following decision:

'(i) That the Medical Association of South Africa agrees to cooperate with insurance organizations which provide prepaid medical care, in order to enable them to provide an adequate medical service to the public, and

'(ii) That the preferential tariff, as amended from time to time, be granted to all groups which can conform with the rules laid down for approval as medical aid societies on the understanding that the organizations administering them will in their turn undertake to pay the accounts of doctors direct and in full.'

At its meeting in Vereeniging, Federal Council now decided to review the abovementioned decision in the light of recent negotiations, and it resolved as follows:

'(i) That groups within the insurance companies be recognized and approved if they conform with a rule requiring them to have an income ceiling to be determined, and certain other standing rules as applicable to medical aid societies.

'(ii) That all insured persons whose incomes are below the income ceiling be placed in an approved group on their own for whom the insurance companies agree to pay the doctors' fees "direct and in full" according to the Tariff of Fees for Approved Medical Aid Societies.

'(iii) That insured persons whose incomes are over the determined ceiling be placed in a different category so that the insurance companies will pay direct to them any indemnity due and they will be classed by doctors as private patients from whom they will collect their fees.'

A number of groups, to which reference will be made in the *Journal* in due course, have been granted approval, but Federal Council decided 'that no further negotiations regarding groups will be undertaken with insurance companies, and no further groups will be recognized until satisfactory arrangements regarding matters affecting the dignity of the profession and the payment of accounts have been finally settled between the Medical Association and the insurance companies'.

2. *Advice Regarding Coded Cheques*

In an Official Announcement which was published in the issue of the *Journal* for 17 September 1960, a special Sub-Committee of Federal Council, which was instructed to discuss the matter of coded cheques issued by the South African Mutual Medical Aid Society with their representatives, decided to give the following preliminary directive to members of the Association: to hold these cheques wherever possible and not to receipt or deposit them until after the next meeting of Federal Council. The Sub-Committee had no alternative but to give this directive, because several new principles emerged from the discussions and the whole problem consequently became fluid again.

After considering this problem from all possible angles at its meeting in Vereeniging, Federal Council took the following decision:

'(i) To advise members that they may accept the coded cheques from the South African Mutual Medical Aid Society, under protest, up to 30 November 1960.

'(ii) Before this date members will be informed of the result of negotiations which are to be conducted by the Federal Council. They will also be advised on a further course of action.

'(iii) Members are advised that all cheques which have been issued to them for an amount less than tariff rates are understood to have been issued in error and can be returned to the sender for adjustment.'

The abovementioned recommendations refer to cheques issued in respect of services rendered to members of groups before these groups were approved. Members should, however, keep in mind that a number of groups — to be referred to in a later issue of the *Journal* — have now been granted approval. Therefore, cheques received in respect of services rendered to members of these approved groups will be in order if made out at medical aid rates, even after 30 November.

Members of the Association will be kept fully informed regarding any new developments in connection with the matters mentioned here, by means of notices in the *Journal*.

Vereeniging
21 October 1960

E. W. Turton
Chairman, Federal Council

Suid-Afrikaanse Tydskrif vir Geneeskunde : South African Medical Journal

VAN DIE REDAKSIE : EDITORIAL

TATOEËERMERKE

Die Egiptenare is, sover bekend, die vroegste volk wat hulle liggame met getatoeëerde patrone versier het. Mummies van 2000 v.C., byvoorbeeld, toon hierdie verskynsel. Die gewoonte is in 787 n.C. in Engeland deur die kerk verbied en is weer herontdek met ontdekkingsreise. Die woord is afgelei van Kaptein Cook se verslag dat die inwoners van Tahiti van albei geslagte hulle liggame verf deur swart kleurstof onder die vel in te lê. Hulle het dit genoem ‚Tattow'.[1]

Enige geneesheer, veral diegene wat baie met die Kleurlingbevolking in aanraking kom, sal getref wees deur die hoë voorkoms van hierdie gewoonte onder hulle, veral onder diegene van hulle wat seevarende ambagte volg. Die hoë voorkoms van hierdie gebruik onder mans en die seldsaamheid daarvan onder vrouens, is ook opvallend. Ebensten[2] beweer dat dit as 'n simbool van rypheid onder sekere groepe geld, met ander woorde, rypheid as soldaat of seeman. Hierdie groepe se prestige word dan verhoog deur die aantal getatoeëerde seniors in hul range. Onder ander redes meen Ebensten dat oorlogskentekens as 'n masker vir 'n sagmoedige geaardheid verkies mag word. Die naakte vrouefiguur mag homoseksuele neigings probeer weerspreek, of godsdienstige tekens mag as simbool dien vir innerlike gebrek aan oortuiging. Die pynlike tatoeëerproses mag masochistiese drange verlig. In sommige lande word die tatoeëerwerk veral deur vroue gedoen, en dit verklaar waarskynlik die interessante gesegde dat tatoeëermerke 'n mens aan die moontlikheid van 'n sifilitiese infeksie moet laat dink. Onder primitiewe volkere was dit 'n aanvaarde veronderstelling dat tatoeëermerke identifikasie in die geestewêreld vergemaklik. Hoër beskaafde volke gebruik hierdie soort merke vir identifikasie van gevangenes; ook word die gebruik van tatoeëermerke aanbeveel as 'n metode om die bloedgroep van persone aan te dui met die oog op spoedeisende optrede in gevalle van ongelukke.

Verskillende stowwe word vir verskillende kleure gebruik, bv. swart (skyn deur die vel as blou-swart) kan die gevolg wees van koolstof, ysteroksied, of sekere houtsoorte. 'n Rooi skynsel kan veroorsaak word deur kinnabar (kwiksulfied) of kadmium selenied. Ander kleure wat gebruik word is groen, van chroomoksied of ftalosianiedkleurstowwe. Geel tatoeëermerke is nie gewild nie, want hulle is geneig om blase te vorm in sonlig.

Onder komplikasies kan kokkale infeksie of selfs sifilitiese of tuberkuleuse infeksies, genoem word. Velreaksies, soos psoriase, lupus eritematose, lichen planus, keloïed formasie, en hipersensitiwiteit vir kwikpreparate kan genoem word.[1]

Tatoeëring kan ook nuttig wees en gebruik word om 'n naevus flammeus te verberg. Dit het Virchow se aandag 'n eeu gelede gevestig op limfdreinasie toe hy kinnabar in die okselkliere van 'n erg getatoeëerde soldaat gevind het.[3] Tatoeëring kan die gevolg wees van ongelukke soos skietongelukke, waar kruit onder die vel ingeblaas word. Dit is ook 'n industriële siekte by steenkappers, mynwerkers, en sweisers.

Daar is ook omstandighede buite menslike beheer! Die deursteekte hartjie met byskrif ‚Ewig joune Annie', mag dalk gewysig moet word om trou te sweer aan Mabel of Ora, of dit mag gebeur dat die nuwe beminde nie graag wil hê dat haar minnaar sy gevoelens op sy mou moet dra nie! Om nou hierdie simbole te verwyder is moeilik. As die letsels klein is kan hulle weggesny word en met of sonder transplantaat genees word. As die materiaal oppervlakkig is, kan dit weggeskuur word met sandpapier. Die gebruik van vretende stowwe op die oppervlakte word nie aanbeveel nie, en oor die algemeen gee behandeling nie goeie kosmetiese resultate nie.[4]

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COUGH REMEDIES

A great variety of cough mixtures is to be found in pharmacies and other stockists of this type of remedy. Many of these remedies are used on an empirical basis, but there is no question that proper evaluation and controlled clinical and experimental techniques will eventually result in the discarding of many of these traditional mixtures. Considerable doubt has been expressed in recent years regarding the value of so-called expectorant drugs used in the treatment of cough. The inhalation of steam or of cold vapour as an aerosol is believed by many to be the most efficient agent in the treatment of non-productive cough; humidification promotes the removal of secretions in the respiratory tract and diminishes the impulses arising from irritated areas.

The use of cough remedies is only justified as symptomatic treatment after proper investigation has been made to determine the cause of the cough. Many diseases may produce cough, and a great variety of agents and methods of treatment are used to deal with the underlying condition — chemotherapy, anti-allergic regimes, cardiotonic drugs, and surgical techniques. Symptomatic control of cough may be used concurrently with such basic treatment. For many people, however, the common occurrence of cough in acute respiratory diseases has made cough remedies an indispensable item in the domestic medicine-chest in addition to such drugs as aspirin.

Most drugs which depress the central nervous system will have an effect on the cough centre in the medulla. However, the centrally acting antitussive agents that have proved especially useful in diminishing the cough reflex, by raising the central threshold, include several important drugs. The opium alkaloids, natural and synthetic, have for long been used as cough suppressants. The use of morphine is limited by side-effects such as depression of

respiration, constriction of tracheobronchial smooth muscle — especially in allergic subjects — and reduction of bronchial secretion. In addition it may dull the sensorium, and cause nausea, anorexia, and constipation, and there is the hazard of drug addiction. Codeine is weaker in action, but is favoured because of the lower incidence of side-effects. Dihydrocodeinone ('dicodid') is in many ways superior to codeine because of even less side-effects. Pholcodine is also more potent and produces less adverse side-reactions than codeine. Methadone and 'pethidine', which are not opiates, are also potent antitussive agents, but are subject to the same drawbacks as morphine.

Among the non-narcotic agents used to depress the cough centre are dextromethorphan ('romilar'), noscapine (narcotine, an opium alkaloid), carbetapentane citrate ('toclase'), and others. Unlike its laevorotatory homologue, dextromethorphan possesses no significant analgesic properties, no depressant effect on respiration, and no addiction liability.[1] Its antitussive action is approximately as great as that produced by equal doses of codeine. The incidence of side-effects is low. Noscapine is of course not a new drug, but its name has been introduced because the original name narcotine erroneously suggested the drug is narcotic. In the treatment of cough it appears to be equal to codeine, and produces minimal side-reactions. It appears to be particularly effective in spasmodic cough. Carbetapentane has antitussive, atropine-like, and local-anaesthetic properties, but more data are required for the complete evaluation of this drug as a cough remedy.

Another group of agents used to diminish cough act peripherally on the respiratory tract to reduce the impulses which pass to the cough centre. They may act by producing a mild analgesic action on the mucosa of the tract, by reducing the viscosity of the mucus in the passages and thus facilitating the expulsion of retained secretions, by humidifying the tract, and by relaxing the smooth muscle spasm. The agents that produce these effects still require much study. Many are to be found in the empirical syrups that through some pharmacological and psychological effect produce relief of cough or comfort in the patient.

The term smoker's cough has entered the literature but is still ill-defined. It is perhaps not an entity but comprises coughs of varying aetiology, aggravated by irritants including tobacco smoke.

The development of experimental techniques and proper clinical trials has given new impetus to the search for better cough remedies,[2,3] thus following the general trend in therapeutics.

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'CARBOCAINE' : CLINICAL USE OF A NEW LOCAL ANAESTHETIC

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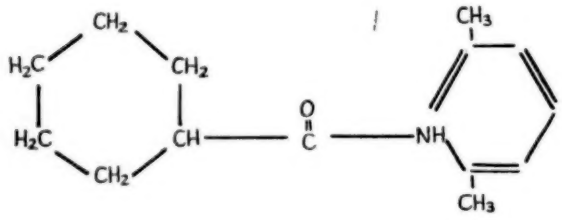
A great deal of work has been done in an attempt to produce safer and more effective local anaesthetic drugs. Carbocaine is a recent addition to this list, and claims have been made for it which indicate that, under certain conditions, it might be the drug of choice.

Chemically it differs from the other commonly used local anaesthetics, having the following formula:[1]



The following advantages have been claimed for carbocaine:

1. Rapid onset of analgesia[3,4]
2. Intense analgesia[3,4]
3. Long duration of action if used with adrenaline[1,3]
4. Effective analgesia if used without adrenaline[1-5]
5. Great potency[3,5]
6. Low systemic toxicity[1-3]
7. Low tissue toxicity[1-6]
8. It does not inhibit the action of sulphonamides[8]
9. Stability — it can be boiled repeatedly.[1]

THIS SERIES

The series here reported consists of nerve blocks and infiltrations performed on 109 listed and emergency cases in a busy general hospital (Table I).

TABLE I. TOTAL NUMBER OF CASES

Epidural (lumbar 37, caudal 5)	42
Brachial plexus block	27
Abdominal field block	5
Deep cervical block	1
Posterior splanchnic block	4
Finger, wrist, and elbow blocks	12
Miscellaneous	18
	109

The results have been analysed and the following extracted.

1. *Onset of analgesia.* From Table II it will be seen that with carbocaine large nerve trunks required 13 minutes, on an average, and small nerves 7 minutes, for a block to become effective. After direct infiltration of the area of operation, however, analgesia was instantaneous. The presence of adrenaline made no difference to the speed of onset of analgesia. There was no difference in the speed of onset between carbocaine and lignocaine (Table III).

2. *Intensity of analgesia.* That produced by carbocaine was similar to the intense analgesia of lignocaine.

TABLE II. TIME OF ONSET OF ANALGESIA AND ITS DURATION: CARBOCAINE

	Time of onset		*Duration*	
	With adrenaline	*Without adrenaline*	*With adrenaline*	*Without adrenaline*
Epidural block	13 minutes [5 - 20] (18)	13 minutes [10 - 20] (8)	165 minutes [135 - 180] (12)	105 minutes [90 - 120] (5)
Brachial plexus block	13 minutes [5 - 30] (23)	11 minutes [8 - 13] (4)	228 minutes [150 - 330] (13)	100 minutes [75 - 120] (4)
Minor nerve blocks	7 minutes [4 - 15] (4)	7 minutes [5 - 12] (7)	210 minutes [180 - 240] (4)	100 minutes [75 - 125] (6)
Direct infiltration	Instantaneous		210 minutes [180 - 260] (4)	90 minutes [60 - 125] (6)

Figures in square brackets [ ] give the minimum and maximum range in minutes.
Figures in round brackets ( ) give the number of cases.

3. *Duration of analgesia* (Table II). The addition of adrenaline made a striking difference to the duration of the analgesia. *Without adrenaline* all effective concentrations of carbocaine gave an analgesia lasting about 100 minutes. *With adrenaline* the average duration rose to over 200 minutes, except for epidural blocks (Table III), where the average was 165 minutes. The concentration of adrenaline used was 1 in 200,000.[3]

TABLE III. ONSET AND DURATION: EPIDURAL BLOCKS*: COMPARISON OF CARBOCAINE WITH LIGNOCAINE

	Carbocaine	*Lignocaine*
Onset ..	13 minutes (18 cases)	12 minutes (49 cases)
Duration ..	165 minutes (12 cases)	150 minutes (18 cases)

* All with adrenaline 1 in 200,000.

4. *Effectiveness without adrenaline*. With the exception of cocaine, the action of all local analgesic drugs is greatly enhanced by the addition of adrenaline. The adrenaline acts by reducing absorption of the drug at the site of injection and so (*a*) increases the duration and (*b*) the intensity of the local analgesia, and (*c*) decreases the rate of absorption of the drug and so decreases the risk of toxic reactions, or, alternatively, allows a larger dose of drug to be injected.[9] Carbocaine without adrenaline gave a highly satisfactory block in all the cases. The only difference noticed was the decreased duration of the block (Table II). It is therefore the local anaesthetic of choice wherever injections have to be made in the vicinity of end-arteries e.g. when blocking a finger. It is far more satisfactory than lignocaine without adrenaline.[3]

5. *Potency*. The potency of carbocaine is indicated in the following table:

Concentration of carbocaine	*Infiltration*	*Nerve block (brachial plexus)*
0·25%	Adequate analgesia	Inadequate analgesia
0·5%	Intense analgesia	Adequate analgesia. Motor power still present
1·0%	Intense analgesia	Intense analgesia. Marked paresis
1·2%	Intense analgesia	Intense analgesia. Complete paralysis

6. *Systemic toxicity*. Claims are made that carbocaine is considerably less toxic than lignocaine.[1-3] The usual signs of overdosage are: (*a*) central nervous irritability — apprehension, nausea and vomiting, twitching, convulsions; and (*b*) cardiovascular and respiratory depression going from a mild drop in blood pressure to an apnoeic pulseless state.[10] In the present series no signs of toxicity from carbocaine were encountered, notwithstanding that several of the patients were desperately ill. Some of them were emaciated, many were old (7% of the entire series being over 80 years of age), while 4 were deeply jaundiced. In no case did the total dose of carbocaine exceed 0·5 g. Since the dose must always be considered relative to the condition of the patient, a fit healthy patient should tolerate more than 0·5 g. of carbocaine.[9]

7. *Tissue toxicity*. No evidence of damage to tissue was seen.

8. *Inhibition of sulphonamides*. This was not considered in the present series but, unlike procaine and amethocaine, carbocaine is not broken down to *p*-aminobenzoic acid, and so does not inhibit sulphonamides.[8]

9. *Stability*. Many of the nerve blocks in this series were performed after the carbocaine had been autoclaved, on some occasions several times. The drug was effective in all cases.

Comparison with Lignocaine

In Table III a comparison is made between a series of lumbar epidural blocks with carbocaine and a series with lignocaine, plus 1 in 200,000 adrenaline in all the cases. No difference was noted in time of onset and intensity of analgesia.

The average duration of analgesia with carbocaine was 165 minutes (12 cases), which is slightly longer than the average duration with lignocaine, which was 150 minutes (18 cases). This agrees with other workers.[1,3]

Although no cases in this series were given lignocaine without adrenaline, extensive comparisons by several workers have shown lignocaine without adrenaline to be markedly inferior to carbocaine without adrenaline.[1-5]

Whereas lignocaine produces drowsiness from systemic absorption when used in large doses, this effect was not noticed with carbocaine in the present series.[11]

SUMMARY AND CONCLUSIONS

The results in a series of 109 cases of nerve block performed with carbocaine are analysed, and certain com-

parisons are made with lignocaine. The following conclusions are drawn:

Carbocaine is a highly effective local anaesthetic. It has a rapid onset, the analgesia produced is intense, and the duration of anaesthesia is effectively controlled by the addition or omission of adrenaline. It is a drug of low general toxicity, and does not irritate tissues or delay healing in the concentrations recommended.

Has carbocaine a place in clinical use? Of recent years lignocaine has been considered the drug of choice. However, in all types of local analgesia (excluding topical and spinal analgesia, which were not tested) carbocaine is as effective and safe as lignocaine. It has certain noteworthy advantages over lignocaine, as follows:

1. It is highly effective when used without adrenaline, while the effect of other local anaesthetic drugs is decreased in these circumstances. This has 2 advantages, viz.:

(*a*) It makes it the anaesthetic of choice when an end-artery is in the region of the nerve to be blocked, e.g. in a finger nerve block, or when a local anaesthetic is being used in the region of diseased arteries, as in vascular investigations or in vascular surgery.

(*b*) It enables carbocaine to be used without adrenaline as a medium short-acting drug, or with adrenaline as a long-acting drug. If 0·5 g. of carbocaine has to be exceeded, then adrenaline 1 in 200,000 should be added. This will decrease the rate of absorption and so minimize the chance of toxic reactions.

2. Carbocaine is less toxic than lignocaine, and so should be preferred to lignocaine, especially in the aged, in the very sick, and where large quantities have to be injected.

3. The average duration of action of carbocaine when used with adrenaline is slightly longer than that of lignocaine.

The recommended concentrations of carbocaine are as follows:

Infiltration anaesthesia	0·25 - 0·5%
Nerve block for small nerves	0·5 - 1·0%
Nerve block for large nerves	1·0 - 1·2%

If it is desired to retain motor power in doing a brachial-plexus block, then 0·5% carbocaine should be used. Carbocaine 1·2% will cause complete paralysis.

Adrenaline should be added if analgesia is required for more than 1½ hours, or if very large doses are to be injected.

Adrenaline should *not* be added if less than 1¼ hours of analgesia is required, or if the injection is in the region of an end-artery.

I wish to thank Dr. J. G. Woeke for treating some of the cases, and Drs. C. S. Jones and G. G. Harrison for their help and encouragement. I am grateful to Dr. J. G. Burger, Medical Superintendent, Groote Schuur Hospital, for permission to publish these cases. Also I should like to thank Messrs. Westdene Products (Pty.) Ltd., for the liberal supplies of carbocaine they gave me for this trial.

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TRENDS IN PROPHYLACTIC DIPHTHERIA IMMUNIZATION IN JOHANNESBURG

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Effective diphtheria immunization consists of a primary course of injections followed by a reinforcement dose (booster) at a later date.[1-3] It is generally agreed that the primary course should be given early in life, preferably at 3 - 6 months of age,[1,4-9] and that the injections should be spaced with an interval of 4 - 8 weeks.[1,6,8,9] There is a difference of opinion on the need for 2 or 3 injections[1-3,6,9,16,21] but Scheibel *et al.*[3] have shown that 2 doses of a potent, adsorbed antigen suffice to produce a satisfactory immunity, which in most individuals is of several years' duration. In a small proportion of the individuals, however, the antitoxin level will have fallen below the assumed protective level 1 year after the primary course[3] and, consequently, a booster is called for at this time. This will ensure an immunity lasting 8 - 9 years, possibly longer,[10] which appears to be unrelated to the epidemiological environment.[10] Thus it seems unnecessary to include further booster doses in a practical routine immunization programme.[10] By this method of prophylactic immunization, diphtheria has been suppressed in many places[1,4,11] and eradicated in some.[12,13]

In South Africa we have failed to take full advantage of prophylactic diphtheria immunization. Here the disease has been endemic for many years[6,14,15] and at least up to 1952 there were no signs of a decline in morbidity rate.[11] In 1955, at a time when the disease had become a rarity in many countries, 242 deaths from diphtheria were recorded in this country.[16]

As shown by notification rates, diphtheria is particularly frequent in Johannesburg with the highest incidence in its White population.[11] Studies in 1955[17,18] showed that a considerable proportion of the White children had not been immunized, that the degree of prophylactic immunization was related to socio-economic standards, and that the trends in immunization were such that a rapid decline in morbidity could not be expected. Prophylactic work among the Bantu is organized by the City Health Department, but so far no figures have been published on which to assess the degree of immunity conferred upon this group. This is regrettable since the Bantu constitute the largest section of the population[22] and since the disease

appears to take a particularly serious course in this race.[11,20]

As diphtheria is still prevalent in Johannesburg we decided to examine critically the present system of administration of the prophylactic, to enable us to devise ways of intensifying preventive measures and thereby to bring about a decline in morbidity. This demands a knowledge of the population at risk, which one of us (V.B.) has assembled and will publish separately.[19]

MATERIAL AND METHODS

The data required for the present survey were collected from questionnaires asking for the following information: (1) suburb of domicile, (2) race, (3) child's first name, (4) date and year of birth, (5) previous clinical diphtheria, (6) number and dates of prophylactic injections against diphtheria, and (7) whether the prophylactic had been administered by a general practitioner or at the municipal clinic. To obtain maximum cooperation, the exact address and the family surname were left out of the questionnaires. Contact with the families was established through the health visitors employed by the Johannesburg Municipal Health Department who pay a routine visit to the home of every newborn child in the municipal area. On their visits to White, Asiatic and Coloured homes during the period October 1957 - April 1958 they filled in questionnaires on all siblings born after 31 December 1949. Difficulties in obtaining accurate information from the Bantu made it necessary to exclude this group from the survey.

It was expected that the sampling method used would yield information from a representative cross-section of the surveyed ethnic groups, provided the immunization histories of siblings were the same as those of single children, who admittedly are ignored. Duplication of observations was avoided by restricting the survey to a 7-months' period.

The criteria adopted to ascertain the individual's immunization status are, with 2 exceptions, identical to those previously described.[18] Firstly, 15 children, 10 White and 5 Coloured, were considered to be non-immunized, since we were unable to find out whether they were immunized or not. Secondly, 55 White, 6 Asiatic and 14 Coloured children, who had received only 1 prophylactic injection more than 3 months before the questioning, were also allocated to the unimmunized group.

RESULTS

Of 5,024 questionnaires returned, 4,948 (98·5%) contain sufficient information to allow tabulation. Of these, 3,908 refer to White, 543 to Asiatic and 497 to Coloured children. For the sake of clarity these groups will be considered separately.

White Children

Based on the address, the questionnaires are divided according to their origin from 3 socio-economic classes: the above medium (A), the medium (M) and the under medium (U).[19] While the distribution of returned questionnaires from A- and M-classes (Table I) is in agreement with the distribution of live births in the districts in 1958,[19] there is an unexpected excess of about 666 observations in the U-class, equivalent to approximately 17·0% of the total number of observations in White children. This may be due to a different family pattern in the U-districts as compared to the M- and A-districts or to a difference in the seasonal distribution of births between the socio-economic groups.[19] Hence, results based on calculations of the total material in the White group will be slightly in favour of the conditions prevailing in the U-class. On the other hand, we have no evidence to suggest that the material is not fully representative of the individual socio-economic classes as presented in Table II.

TABLE I. NUMBER OF OBSERVATIONS IN WHITE SOCIO-ECONOMIC CLASSES COMPARED WITH NUMBER OF LIVE BIRTHS IN 1958[19]

	Observations		*Live births, 1958*	
Class	*Number*	*Proportional distribution*	*Number*	*Proportional distribution*
Under medium	2,599	66·5%	5,551	59·2%
Medium	1,076	27·5%	3,140	33·5%
Above medium	233	6·0%	670	7·2%
Total	3,908		9,361	

This shows that the percentage of children given the primary course of prophylactic (column 4) increases with socio-economic standard. On an average 38·3% of the U-class children born after 1949 were unprotected at the time of the survey as against less than 1% of the A-class children. The declining immunization rates in the younger children of the U- and M-classes are probably attributable to the local practice of giving the primary course at any time from birth to well beyond 5 years of age.[18] Of greater prophylactic importance and statistically more valid than total immunization rates is the percentage of individuals immunized before their second birthday.[18] This percentage is calculated from the questionnaires about children aged 2 years or more at the time of the survey (born before 1956) giving precise information of injection dates. The figures, presented in column 5, are corrected by proportional allocation of those children of the same age (77 in U-, 18 in M- and 4 in A-class) who were stated to be immunized but lacked particulars of time (column 6). It shows that just over half of the surveyed children in the U-class, the majority in the M-class and practically all in the A-class received their primary course before the third year of life. The percentages in the M- and U-districts vary slightly from year to year. There has not been a fall in early immunization in recent years, but although the latest figures appear to be slightly higher, it is doubtful whether this may be considered a true rise.

The administration of boosters is summarized in Table III which shows that the White children in Johannesburg seldom receive them. The booster rate is related to socio-economic standard, being higher in the wealthier classes.

In Johannesburg the prophylactic injections are given either by general practitioners or at the municipal clinics. The distribution of the work is calculated from the questionnaires with section 7 completed (Table IV). The discrepancy between 'total number of immunized children' (Table II) and the number tabulated under place of immunization (Table IV) may be attributed to some extent

TABLE II. PRIMARY COURSE OF DIPHTHERIA IMMUNIZATION IN WHITE SOCIO-ECONOMIC CLASSES

Class	Year of birth	Observations		Immunized		Immunized under 2 years of age			
				Number	%	Number		Corrected number	% of observations
Under medium	1950	218	2,071	167	76·6	104	1,057	112	51·4
	1951	262		184	70·2	128		134	51·2
	1952	337		223	66·2	160		171	50·7
	1953	365		234	64·1	175		188	51·5
	1954	413		271	65·6	229		238	57·6
	1955	476		276	58·0	261		272	57·1
	1956	476		228	47·9				
	1957	52		21	40·4				
	Total	2,599		1,604	61·7				
Medium	1950	76	875	74	97·4	64	741	64	84·2
	1951	94		84	89·4	78		80	85·1
	1952	144		129	89·6	123		126	87·5
	1953	145		132	91·0	124		127	87·6
	1954	172		145	84·3	140		143	83·1
	1955	244		217	88·9	212		217	88·9
	1956	189		140	74·1				
	1957	12		5	41·7				
	Total	1,076		926	86·1				
Above medium	1950	23	203	23	100	22	199	23	100
	1951	29		29	100	28		29	100
	1952	36		36	100	35		36	100
	1953	29		29	100	28		29	100
	1954	40		40	100	40		40	100
	1955	46		46	100	46		46	100
	1956	29		27	93·1				
	1957	1		1	—				
	Total	233		231	99·1				

TABLE III. BOOSTER INOCULATIONS IN WHITE SOCIO-ECONOMIC CLASSES

Class	Immunized	Boosters given	
		Number	%
Under medium	1,604	16	1·0
Medium	926	29	3·1
Above medium	231	28	12·1

to the fact that the parents of some children stated when the children were immunized but not by whom. In other cases, place of immunization was stated, but as they received one injection only, and this more than 3 months before, they were considered unimmunized. Several of the 75 children mentioned under 'material and methods' fell in this category. It is interesting to note that, at least since 1950, the general practitioners have dealt effectively with the required diphtheria immunization in the A-districts. In the M-districts most of the work (75%) is undertaken by the private doctors, while the municipal clinics are responsible for about 25%, a situation which has remained practically unchanged during the surveyed period. In contrast, the municipal clinics carry the main burden in the poorer districts and their share of the work seems to have been increasing in recent years.

Asiatic Children

A return of 543 questionnaires from the Asiatic, compared to 3,908 from the White group, is proportional to the estimated annual number of live births in the 2 groups.[19] Table V, in which the observations are tabulated,

TABLE IV. PROPHYLACTIC DIPHTHERIA IMMUNIZATION IN WHITE CHILDREN BY GENERAL PRACTITIONERS OR MUNICIPAL CLINICS

Year of birth	Under medium			Medium			Above medium		
	GP	MC	GP%	GP	MC	GP%	GP	MC	GP%
1950	84	81	50·9	54	19	74·0	20	3	87·0
1951	95	93	50·5	55	27	67·1	26	3	89·7
1952	112	115	49·3	104	30	77·6	35	1	97·2
1953	118	121	49·4	97	33	74·6	29	—	100
1954	140	135	50·9	114	31	78·6	38	2	95·0
1955	120	155	43·6	168	49	77·4	42	4	91·3
1956	98	135	42·1	101	41	71·1	26	2	92·9
1957	15	4	—	4	2	—	1	—	—
Total	782	839	48·2	697	232	75·0	217	15	93·5

Figures indicate number of inoculated children. GP = general practitioner, MC = municipal clinic, and GP% = percentage immunization by general practitioner.

TABLE V. PRIMARY COURSE OF DIPHTHERIA IMMUNIZATION IN ASIATIC CHILDREN

Year of birth	Observations	Immunized		Immunized under 2 years of age			Immunized by	
		Number	%	Number	Corrected number	% of observations	GP	MC
1950	39	22	56·4	1	3	7·7	12	9
1951	59	30	50·9	6	10	17·0	14	13
1952	79	26	32·9	7	14	17·7	16	11
1953	94	25	26·6	12	18	19·1	12	12
1954	91	41	45·1	16	36	39·6	23	20
1955	89	29	32·6	19	28	31·5	20	11
1956	85	25	29·4				10	16
1957	7	1	—				—	1
Total	543	199	36·7				107	93
	451			61	109	24·2		

Abbreviations: See Table IV.

shows that just over one-third of the Asiatic children born since 1949 have received a primary course of diphtheria prophylactic. The immunization rates fluctuate somewhat from year to year but by applying a moving average of 3-year periods, it would appear that the immunization rates are falling to about 35% for children born in the later part of the period under consideration. The children immunized before 2 years of age, calculated as in Table III, amount to about one-quarter of the total. Late immunization was the rule among the oldest children in the survey, but the figures indicate a growing tendency towards earlier prophylactic immunization. Not a single Asiatic child received a booster. The last two columns of Table V show that just over half (53·5%) of all immunized children were immunized by a private practitioner and the rest in municipal clinics. This distribution of work has not changed significantly since 1950.

Fig. 1. Organization and average results of prophylactic immunization 1950 - 55. A, M and U = White socio-economic classes, AS = Asiatic, and C = Coloured.

Coloured Children

Compared to the annual number of live births,[19] a slightly higher proportion of questionnaires were completed by Coloured people than by other ethnic groups. The results are presented in Table VI, which shows that just under half the children received a primary course and that the percentage immunized is decreasing slightly among the younger children. About a third of the children were protected before the second birthday with a tendency in recent years towards earlier administration of the primary course. Most of the prophylactic work (93·8%) was done by the municipal clinics and 6·2% by general practitioners, a distribution of labour that has not changed since 1950.

TABLE VI. PRIMARY COURSE OF DIPHTHERIA IMMUNIZATION IN COLOURED CHILDREN

Year of birth	Observations	Immunized		Immunized under 2 years of age			Immunized by	
		Number	%	Number	Corrected number	% of observations	GP	MC
1950	46	25	54·4	6	17	37·0	2	24
1951	37	17	45·9	5	11	29·7	1	16
1952	74	44	59·5	12	23	31·1	4	34
1953	69	31	44·9	11	24	34·8	1	34
1954	81	39	48·2	17	35	43·2	2	41
1955	81	37	45·7	30	37	45·7	2	39
1956	100	36	36·0				3	36
1957	9	5	—				—	5
Total	497	234	47·1				15	229
	388			81	147	37·9		

Abbreviations: See Table IV.

Comparative Summary

To sum up and compare the above observations, the findings are presented in Fig. 1. The left part of the histogram, giving the total result of prophylactic diphtheria immunization in all age groups, shows that immunization rates fall with reduced socio-economic standard from 99·1% in the A-class to about 40% in the Asiatic and Coloured groups. We do not know if there is a real difference in living standards between the Asiatic and Coloured groups, but it is usually maintained that the Coloured standard is lower. It is interesting to note that along with the decline in immunization rates there is an

even greater decline in the prophylactic work borne by the general practitioners; in other words, the poorer the people the greater the burden which is carried by the municipal clinics. This part of the histogram does not represent the entire work of either of the 2 immunizing bodies, since they also immunize children born before 1950; nor does it reflect the beneficial effect to the community which is related to the amount of prophylactic work carried out in children under 2 years of age.[18] This work, calculated for children born from 1950 - 55, is presented in the histogram on the right, which shows an even sharper decline in immunization rates with falling standard of living. In conclusion, diphtheria immunization in the poorer White class as well as among non-Whites must be characterized as unsatisfactory both with regard to extent and to time. In fact, it is doubtful whether these low rates influence morbidity and mortality in the respective groups.[18]

Immunization Clinics

The proportion of children protected against diphtheria depends upon the attitude of the population towards prophylactic immunization and on the facilities offered for its execution. Prophylactic injections may be obtained against a fee from the general practitioner or free of charge at the municipal clinics. Thus, the municipal clinics are our most important instruments in preventive work. Until 1959, 31 clinics were available in the Johannesburg municipal area; Fig. 2 shows these clinics superimposed on a map of the city's socio-economic districts.[19]

The White group was provided with 18 clinics of which 1 was in the A-districts (670 live births *per annum*), 8 in the M-districts (3,140 live births *per annum*), and 9 in the U-districts (5,551 live births *per annum*).[19] Thus, in the White districts 1 clinic was available for every 500 - 600 children born *per annum*. Five clinics were available for immunization of Asiatic and Coloured children (1,724 live births *per annum*), or 1 clinic per 300 - 400 children, and 8 for Bantu (13,014 live births *per annum*), or 1 clinic per 1,600 - 1,700 children.[19] As a rule the clinics were open once a week, some for a few hours, and others for the whole day, but the duration of service was adjusted to satisfy the demand. Excess of work has never forced the clinics to turn people away and no shortage of prophylactic has been encountered. Because of the reduced demand for immunization at the outlying subsidiary clinics, this service for White children was reduced to 3 clinics in 1959, the central immunization clinic in district U5 which is open daily, 1 in district U1 and 1 in U7. Clinics were placed in the latter 2 districts because of the prevalence of diphtheria.[22] No alteration has been made in the immunization service for Asiatic, Coloured or Bantu children.

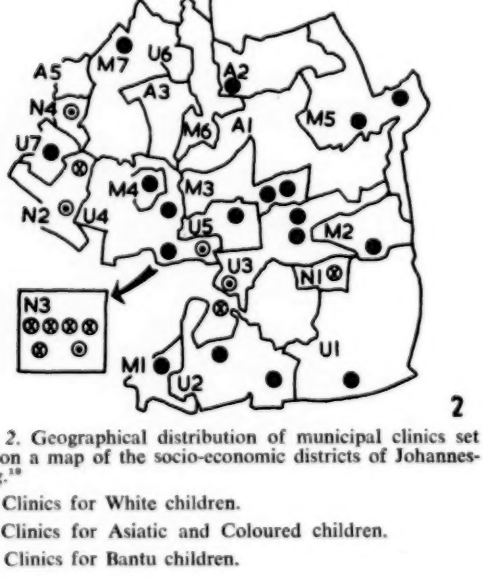

Fig. 2. Geographical distribution of municipal clinics set out on a map of the socio-economic districts of Johannesburg.[19]

- ● Clinics for White children.
- ⊙ Clinics for Asiatic and Coloured children.
- ⊗ Clinics for Bantu children.

DISCUSSION

In the previous survey on diphtheria immunization of White children in Johannesburg[18] it was found that since 1935 there has been a steady tendency towards increased and earlier administration of the prophylactic. It was calculated from Table II that, of 2,383 White children 1950 - 54 had been immunized before the age of 2 years, but it was considered doubtful whether the figure was representative.[18] Notwithstanding the slight preponderance of U-class observations in the present material, it may be calculated from Table II, that of 2,383 White children born in that quinquennial, 1,800 (75·5%) had received a primary course of prophylactic and 1,540 (64·5%) received it before 2 years of age, thus showing, as anticipated, that the previous observations for the period were not representative. On the other hand, it also shows that, as compared with the period 1945 - 49,[18] there has been an improvement in the general immunization rate by at least 7·6% and, in the under-2-year-olds by at least 14·6%. Having registered these favourable signs it must be pointed out that the figures presented demonstrate clearly the inadequacy of prophylactic immunization in the White lower income group both with regard to primary course and booster injections. There are no signs of the boosters becoming more popular since 1955,[18] a regrettable observation because many children, protected for a while by the primary course, may in the absence of silent infections become susceptible to the disease.[3] Thus, the omission of booster doses lessens to a large extent the value of the primary course.

The same is true for Asiatic and Coloured children, but in addition the immunization rates are still lower and the boosters still more infrequent. Thus, unless a change takes place we, in Johannesburg, must resign ourselves to the presence of diphtheria and to deaths, which could so easily be avoided. The number of children annually reaching the age of 2 years without immunization is estimated in Table VII. It is based on the annual number of live births[19] corrected for the mortality in the first[19] and second year of life.[23] Inadequacy of statistical information renders impossible a similar calculation for the Bantu. The immunization rates are taken from Tables II, V and

TABLE VII. ESTIMATED NUMBER OF CHILDREN ANNUALLY REACHING THE AGE OF 2 YEARS WITH NO IMMUNIZATION

	Annual number of live births	*Mortality per 1,000*		*Survivors at 2nd birthday*	*Percentage immunized before 2 years of age*	*Number not immunized at 2 years of age*
		1st year of life	*2nd year of life*			
Above medium ..	670	34·9	4·3	644	100	0
Medium	3,140			3,017	86·5	407
Under medium ..	5,551			5,334	53·8	2,464
Asiatic	939	66·3	21·0	858	24·2	650
Coloured	785	133·3	61·0	639	37·9	397
Bantu	13,014	131·1	?	?	?	?

VI. Table VII shows that all children in the A-class have been protected before 2 years of age. In contrast, in the lower White socio-economic classes nearly 3,000 children a year reaching this age are still in need of the primary course of prophylactic. This also applies to about 650 Asiatic, 400 Coloured and an unknown number of Bantu children.

Possible methods of improving this state of affairs may be considered under 3 different headings: (1) parents, (2) general practitioners, and (3) health authorities and the municipal clinics.

1. *Parents*

When responsible parents know that diphtheria is a dangerous but preventable disease they will have their children immunized; but if they do not hear of diphtheria among children they know, it is understandable that the urge for its prevention may lessen. Therefore, as pointed out by Woodrow[24] and the Ministry of Health,[25] continuous publicity is essential to bring home to parents and guardians of young children not merely their responsibilities but also how, when and where they can take advantage of the health services provided.

The Ministry of Health[25] stresses the importance of team work 'in which family doctors, health visitors, district nurses, staffs of welfare centres and voluntary workers play their part. Personal persuasion is still the most powerful element in any local campaign and will benefit from the "background" publicity afforded by the local press, advertisements, posters, cinema-slides and one-minute films, etc.'. We fully endorse this and may add that use could also be made of postage stamps, radio propaganda and reminders enclosed in packets of baby food, etc.[24] It is our view that in Johannesburg, although most of the above steps are taken, far more could be done in the publicity and propaganda field.

2. *General Practitioners*

It is maintained that parents and guardians on the whole prefer to have their children immunized by their private doctor rather than by the municipal clinic. This is also confirmed in the present survey, where the socio-economic standard is closely related to the general practitioner's contribution to prophylactic immunization. It is possible, therefore, that some parents with an indifferent attitude to immunization may abstain from having it done on the grounds that they are opposed to the municipal clinics and cannot afford medical fees. This might be overcome either by popularizing the municipal clinics through apt advertisements or by introducing a system whereby the general practitioner can perform the inoculation against a fee chargeable to the municipal authorities.

Such a system has been in successful operation in Denmark for many years. Shortly after confinement — for instance on the health visitors' call to the home of a newborn child — the mother is issued with a card bearing the baby's name and birthday. The card has 3 squares, each with a note on the appropriate time for the first, second and third inoculation, which serve as very valuable reminders to the mother. On her immunization visits to the private doctor, she detaches a square, signs it and hands it over. The doctor recovers his fees by submitting the signed squares to the municipal authorities. This system benefits the child, the general practitioner, the state and the exchequer; it is much cheaper to prevent than to treat diphtheria.

From this study it is clear that general practitioners, given the facilities, are able to cope adequately with required immunization. However, their attention must be drawn to the importance of giving a booster a year after the primary course, which has been neglected in the past. They could probably assist further by encouraging and persuading poorer parents to have their children immunized. The rôle of the general practitioner would be considerably increased by the introduction of a card system as described above.

3. *Health Authorities and the Municipal Clinics*

The organization of prophylactic immunization rests mainly on the health authorities. It is their responsibility to advise on practical methods of immunizing the population and as far as possible to create the necessary facilities. The results may be checked through studies of morbidity and mortality rates and, if found unsatisfactory, surveys should be conducted to detect possible errors or methods of improvement. This may involve, as already suggested, publicity campaigns, introduction of a card system and instruction to all immunizing bodies on the importance of boosters.

A further duty of the local health authorities is the administration of the municipal immunization clinics. In view of the urgent need for immunization, the recent decision to stop immunization at the subsidiary clinics and concentrate the effort at the central clinic every day would appear to be a retrograde step, since they may have been able to fill a need and serve a useful purpose, particularly if the public's indifference could be counteracted by more publicity campaigns.

From time to time authors have suggested compulsory immunization,[16,26] which undoubtedly is effective and has been introduced in some countries.[26-28] Other countries have managed the problem on a voluntary basis, a system we feel should continue until it has been conclusively established that it will not result in the elimination of diphtheria.

SUMMARY

1. On the basis of questionnaires the extent of prophylactic diphtheria immunization has been examined among White, Asiatic and Coloured children in Johannesburg, born between 1950 and 1957. It was not possible to include Bantu children in this survey.

2. The immunization rates (primary course) for children 1 - 7 years of age drop from 99·1% in the highest socio-economic class to about 40% in the poorer classes. These rates have remained almost static since 1950.

3. The immunization rates in children under 2 years of age are directly related to socio-economic standard. Since 1950 there has been a slight tendency towards earlier immunization in the Asiatic and Coloured groups, while no significant trend can be shown in the White population.

4. In all the races surveyed, the proportion protected is still grossly inadequate for the elimination of the disease. It is estimated that about 3,000 White children and 1,000 Asiatic and Coloured children annually reach the age of 2 years without immunization.

5. Booster injections are almost entirely ignored.

6. The proportion of prophylactic injections given by general practitioners falls with declining socio-economic status of the population and the reverse holds for municipal clinics.

7. The findings are discussed and alterations suggested which might lead to more children being immunized against diphtheria.

We wish to thank the health visitors on whose assistance the compiling of the material depended; Mr. N. J. Richardson, SAIMR, for technical assistance; Mr. M. Ulrich, photographic department, SAIMR, for the reproduction of graphs; Mr. H. I. D. du Plessis, CSIR, for statistical advice; the Director of the SAIMR, Dr. J. H. S. Gear, and the Medical Officer of Health, Johannesburg, Dr. J. Scott Millar, for permission to publish this paper.

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THERAPY OF INFANTILE GASTRO-ENTERITIS WITH CHLORAMPHENICOL AND NEOMYCIN

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In a trial conducted by the Medical Research Council of Great Britain, sulphonamides and chloramphenicol were found to be the drugs of choice in the treatment of 'non-specific' gastro-enteritis.[1] At Baragwanath Hospital, chloramphenicol was shown to be the most effective drug in the treatment of intestinal shigella and salmonella infections, while sulphonamides, oxytetracycline, and oral streptomycin were relatively ineffective.[2,3] However, since chloramphenicol is potentially toxic and recent *in vitro* tests[3] suggested that neomycin would be almost as good as chloramphenicol in the treatment of shigellosis and better than chloramphenicol in the treatment of salmonellosis, we decided to compare these 2 drugs in a clinical trial.

Neomycin was first isolated by Waksman and le Chevalier at Rutgers University in 1949.[4] It is water-soluble and has a bactericidal action on many Gram-positive and Gram-negative bacteria. It is highly toxic when given parenterally causing auditory and renal damage.[5] However, when given orally very little is absorbed and the action is almost entirely a topical one. This antibiotic has been used quite extensively before operations on the colon and rectum[6] for suppressing intestinal organisms, and is the antibiotic of choice in the suppression of intestinal organisms in hepatic failure.[7] It has also been used in the treatment of pathogenic *B. coli* infection of the bowel. Wheeler and Wainerman[8] had excellent results when using it to treat infants affected with chloramphenicol-resistant *B. coli* and there are several other reports of good results with the use of neomycin in the treatment of pathogenic *B. coli*.[9,10]

There is little information on the efficacy of neomycin in the treatment of shigella and salmonella infections. Ponce de Leon[11] reported that neomycin was successful in the treatment of 15 children with shigellosis. He reported no untoward effects. Rogers *et al.*[12] found it useful in the treatment of *Shigella sonnei* dysentery but found it unsuccessful in the treatment of salmonella carriers.

The comparative lack of information on neomycin in shigella and salmonella infections and its impressive results *in vitro* against these infections prompted us to set up a clinical trial contrasting neomycin with chloramphenicol in the treatment of diarrhoeal disorders in general and shigellosis and salmonellosis in particular.

MATERIAL AND METHODS

The trial was carried out in the summer of 1958 - 1959 in the emergency ward at Baragwanath Hospital where we treat children with severe diarrhoea who require intravenous fluid therapy. Altogether 353 children, all under 3 years of age, were treated in the survey. On admission, rectal swabs were taken for bacteriological examination and all patients were given routine intravenous therapy and other supportive treatment. Alternate patients were given neomycin or chloramphenicol in doses of 40 - 50 mg. per lb. body-weight per 24 hours. Treatment commenced immediately after the rectal swab had been taken and therefore several days before it was known whether the patient was suffering from an infection with shigella or salmonella organisms. Intravenous therapy was continued until the patients were rehydrated and able to retain a maintenance diet. Where deterioration of the condition occurred on this treatment, patients were transferred to the routine wards for further resuscitative measures.

The result of treatment in the groups was judged by the number of deaths, continued deterioration on treatment necessitating transfer to the routine wards, and relapses after discontinuation of intravenous therapy. All patients on whom follow-up investigations could not be carried out and all cases complicated by severe malnutrition were excluded from the trial.

RESULTS

Of the 353 patients (Table I), 28 suffered from salmonellosis, 49 from shigellosis (33 *S. flexneri*, 14 *S. sonnei*, 1 *S. boydii*, and 1 *S. schmitzii*) and the remaining 276 from 'non-specific' acute diarrhoea.

Of the 28 patients suffering from salmonellosis, 12 were in the group treated with neomycin and 16 in the group treated with chloramphenicol; 8 of the 12 treated with neomycin (67%) and 12 of the 16 treated with chloramphenicol (75%) made uncomplicated recoveries.

TABLE I. RESULTS OF CHLORAMPHENICOL AND NEOMYCIN THERAPY IN 'NON-SPECIFIC', SHIGELLA, AND SALMONELLA ENTEROCOLITIS

Organism	*Treatment*	*Total cases*	*Uneventful recovery*	*Deaths*	*Relapses*	*Transfers to routine wards*
'Non-specific' 276 cases	Chloramphenicol	143	118 (83%)	1	5	19
	Neomycin	133	107 (80%)	1	2	23
Shigella 49 cases	Chloramphenicol	22	18 (82%)	0	2	2
	Neomycin	27	16 (59%)	0	0	11
Salmonella 28 cases	Chloramphenicol	16	12 (75%)	0	1	3
	Neomycin	12	8 (67%)	1	0	3
		353				

Of the total of 49 patients suffering from shigellosis 27 were treated with neomycin and 22 with chloramphenicol; 16 of the 27 treated with neomycin (59%) and 18 of the 22 treated with chloramphenicol (82%) made uncomplicated recoveries. Of the 276 patients suffering from 'non-specific' diarrhoea, 133 were treated with neomycin and 143 with chloramphenicol; 107 of the 133 treated with neomycin (80%) and 118 of the 143 treated with chloramphenicol (83%) recovered uneventfully.

DISCUSSION

In this investigation into the treatment of children with severe gastro-enteritis, 14% of cases suffered from shigellosis and 8% from salmonellosis; 22% in all. In 2 previous investigations at Baragwanath Hospital,[2,13] the combined incidence of shigella and salmonella infections in severe gastro-enteritis was 29% in the first investigation and 35% in the second, and it has been estimated that, in actual fact, these organisms are the infecting agents in as many as 50% of cases. In all investigations here shigellosis is approximately twice as common as salmonellosis.

This investigation suggests that chloramphenicol and neomycin are of approximately equal value in the treatment of salmonella and non-specific enteritis. From previous *in vitro* studies we had anticipated that neomycin might have been more effective than chloramphenicol in the treatment of salmonellosis. but it is probably not surprising that this was not so. It is known that a proportion of cases with salmonella enteritis have a septicaemic phase and we have obtained positive blood cultures in such cases, particularly where there is associated purpura.[14] Neomycin is not absorbed from the bowel and is therefore ineffective in salmonella septicaemia.

In the treatment of shigella infections of the bowel, this investigation suggests that chloramphenicol is of greater value than neomycin. Chloramphenicol has also been shown to be of greater value than previously-tested antibiotics in shigella infection and would therefore appear to be the antibiotic of choice in the treatment of shigellosis in our community.

SUMMARY

In previous investigations at Baragwanath Hospital, chloramphenicol proved better than sulphonamides, oxytetracycline and streptomycin in the treatment of intestinal shigella and salmonella infections in children.

In the present investigation, neomycin, which had previously shown very promising results *in vitro* against these organisms, was contrasted with chloramphenicol in the treatment of infantile gastro-enteritis.

The 2 antibiotics were equally effective in 'non-specific' gastro-enteritis and salmonella infections. Chloramphenicol, however, appeared to be better in shigella dysentery.

We wish to thank the Superintendent of Baragwanath Hospital for permission to publish the results of this investigation and Drs. E. Kahn and S. Wayburne for helpful criticism and access to case records. We also wish to thank the South African Institute for Medical Research, Johannesburg, for examining the rectal swabs.

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MEDICAL SERVICES PLAN

REPORT BY DR. M. SHAPIRO, CHAIRMAN, TO THE FIRST ANNUAL GENERAL MEETING HELD AT MEDICAL HOUSE, 5 ESSELEN STREET, JOHANNESBURG, ON TUESDAY 19 JULY 1960 AT 8 P.M.

I have pleasure in presenting the first Annual Report of Medical Services Plan.

The Plan was inaugurated at a general meeting of participating members on 27 April 1959. Members will recall that a financial statement was presented to the inaugural meeting which showed that an amount of £641 2s. 10d. had been expended for office organization and equipment up to that time, but no subscribers had as yet been enrolled. An amount of £6,180 had been received as loans from participating members. Since this time, the amount loaned by participating members has risen to £7,010.

It was resolved by the Board that the period to be covered by the report to this meeting be for the full year from 28 April 1959 to 30 April 1960. All future financial statements will be to the end of each calendar year, in accordance with the provisions of the Friendly Societies Act of 1956 under which we operate.

The first group of subscribing members was enrolled in July 1959, so that there was no subscription income for the first 3 months of the period under review. The Revenue and Expenditure Account shows a total income of £16,930 14s. 2d. of which £96 11s. 11d. was from interest on savings account and £16,834 2s. 3d. was from subscriptions.

The expenditure amounted to £9,717 9s. 4d. for the payment of benefits to subscribers (i.e. for the payment of medical and hospital accounts) of which amount £4,103 12s. 3d. had been paid at the date of the close of this report and a further amount of £5,613 16s. 10d. had been allocated for payment. The administrative expenses amounted to £3,144 13s. 2d. This is 18·6% of the income for the year. However, as has been stated, there was no subscription income for the first 3 months of this period but the expenses for this period amounted to £794. If allowance is also made for the stationery which we still have on hand but which was required to launch the scheme (e.g. printed contracts, brochures, etc.) and has been written off entirely for the purposes of the accounts, the actual administrative cost was only 12·8% of subscription income. You may be interested to know that as at 1 July 1960 the administrative expenses have been computed as only 10% of subscription income.

The policy of the Board in the initial stages of operation of your Plan has been one of extreme conservatism. Although a substantial amount of money was obtained in the form of loans from participating doctors, only a fraction was utilized in the initial stages for essential stationery, office equipment and staff. As shown in the Balance Sheet, at the closing date of this report the Plan had reserves equivalent to the total amount of the participating doctors' loans plus a balance of the capital account amounting to £3,405 8s. 4d. Now that the Plan appears to be securely established it may be necessary to draw on our reserve funds for creating adequate administrative facilities to deal efficiently with the affairs of the Plan. Indeed, it was for this very purpose that the loans were provided in the first instance.

As I mentioned before, the first group to seek coverage by the Plan joined in July 1959. This group was composed of 25 subscribers covering 75 persons, rendering a monthly subscription income of £78. By the end of April 1960, 33 groups had joined the Plan with 887 subscribers covering 2,417 persons, rendering a monthly subscription income of £2,703. In the 2 months following the closing date of this report, 11 new groups have joined the Plan. The figures as at 1 July are as follows:

Number of groups	44
Number of subscribers	1,309
Number of persons covered	3,499
Monthly subscription income	£4,077

At the inaugural meeting it was resolved that the schedule of fees for the Plan should be the Preferential Tariff plus 50% or customary private practice fees whichever was the lesser. From this tariff a deduction of 10% was authorized for administration. It was soon found that the formula could not be applied as there was no official schedule of customary fees. The Council of the Southern Transvaal Branch of the Medical Association of South Africa was asked to provide a schedule of customary fees for this area but was unable to do so as no such official schedule is in existence. The groups were asked to furnish schedules of customary fees and some of them did so. It was apparent that for many items the formula of medical aid fees plus 50% was in excess of what was in fact being charged in private practice in this area. The Southern Transvaal Branch Council of the Medical Association of South Africa has been delegated authority by the Federal Council to watch the interests of the Association in relation to its sponsorship of the Plan. Your Board of Directors therefore approached the Branch Council for guidance and was advised that the Plan should proceed on the basis of the Medical Aid Tariff plus 40% until such time as a schedule of customary fees could be formulated.

Since the time when the proposed formula for the payment of medical fees was adopted, the policy of the Medical Association has itself undergone a radical change. This involves official recognition of the insurance companies and their eligibility for the utilization of the preferential tariff for groups insured with them under the same conditions as have hitherto been applicable to approved medical aid societies. The same formula is presumably applicable to groups covered by Medical Services Plan, but no official intimation of the Association's policy with regard to the Plan has as yet been received by the Board. Quite obviously, it will be necessary to modify the Plan's policy regarding the scale of fees to be applied to persons of the lower-income group who are covered by the Plan, with a corresponding adjustment in subscriptions. While I am sure that the participating members of the Plan will willingly make concessions to the lower income group, it does not necessarily follow that the formula to be adopted by the Plan should be the same as that which has been applied to the insurance companies. The original conception of the Medical Association in sponsoring the Plan was that the subscriptions and the medical fees should be on a sliding scale according to the personal incomes of the subscribing members.

The Steering Committee of the Plan recommended that at the outset there should be a single uniform tariff for all classes; firstly, because of ease of administration and secondly because the policy of the Association at that time was that insured patients (other than medical aid society patients) should be treated as private patients. Now that this policy has been changed, the Board has a duty to subscribers to negotiate a formula which will be in consonance with the new policy of the Medical Association of South Africa and which will be fair to the profession and to the public alike.

The Federal Council at its last meeting resolved that it be recommended to the Plan's Directorate that they extend the Plan to all parts of the country. A number of Branches of the Medical Association have since requested that the Plan be extended officially to their areas. However, your Board of Directors, after serious consideration, resolved that until the policy of the Association in relation to the Plan and to insurance companies is clarified to the satisfaction of the Board, the Plan be not extended beyond its present area of operation. Needless to say, the Board will be only too happy to extend the advantages of the Plan to other areas as soon as it can see its way clear to do so.

In closing, on behalf of the Board of Directors and myself, I wish to record a vote of thanks for the excellent work done by Mr. P. J. Parvus, General Manager, and his staff in bringing the Plan to its present stage of development.

FARMASEUTIESE NUUS : PHARMACEUTICAL NEWS

PARKE DAVIS LABORATORIES AT ISANDO

October 1960 is the first anniversary of the occupation by Parke Davis Laboratories of their new premises at Isando, Transvaal. Now that the various activities carried out there have settled down, it is perhaps apposite to give a brief description of the premises and work carried on therein.

The manufacturing laboratory is designed to meet the anticipated needs for the next 10 - 15 years and embodies the circulation of raw materials in an anti-clockwise direction, *via* the chemical manufacturing, pharmaceutical manufacturing, encapsulation and tabletting departments, to the finished stock department.

Installed in the chemical manufacturing section is specialized equipment for the synthesis of complex organic chemicals. A fact which is not generally known is that Parke Davis is the only concern in Africa which actually carries out the manufacture of an antibiotic, in this case, 'chloromycetin' and 'chloromycetin' palmitate for the suspension.

The section set aside for encapsulation of medicaments in hard gelatine capsules is rigorously air-conditioned as encapsulation can only be satisfactorily carried out in conditions of controlled temperature and humidity. The actual equipment used has been developed by Parke Davis.

Modern and up-to-date equipment and methods are used in the bulk pharmaceutical, tabletting, and filling departments and an interesting point is that much of the equipment has been made in South Africa.

The north-east corner of the factory is devoted to an analytical laboratory where the necessary quality-control tests are carried out. No ingredient enters the manufacturing area without having undergone stringent quality-test analyses and no finished product leaves the area without having similarly been subjected to even more comprehensive analyses. These tests are in addition to the entirely separate control arising from the fact that a specimen of every batch is sent by air for quality-control tests in the parent Company's laboratories in Detroit, USA.

As over 90% of the Parke Davis products sold in Southern Africa — the Union, South West Africa, Rhodesia, Moçambique, Angola, etc. — are manufactured and distributed from Isando, it is imperative that they are identical with those of the parent Company and will meet in full the therapeutic needs of patients in Southern Africa irrespective of widely varying conditions of temperature and humidity.

The administration block comprises private and general offices, conference room, cafeteria, wash-room facilities for European females, European males, and non-European males, as well as an entrance hall with its mural reflecting the global nature of Parke Davis operations.

Excellent distribution of daylight with a minimum of direct sunlight is achieved in the offices by the use of vertical and horizontal fins on the north-facing front.

These fins on the northern facade of the building are clad in satin-finished aluminium and, since the remainder of the facade is glass, upkeep costs are reduced to a minimum. Adjacent to the entrance is a ceramic mosaic which consists of coloured tesserae made in Italy in accordance with the highest standard of workmanship. The mural depicts, in coloured tiles, the tools of a pharmacist's trade — a mortar and pestle, carboy, balance, microscope, and beaker.

NEW MEDICAL FILM

SKF Laboratories have available on loan, without charge, a film entitled 'Psychiatric nursing — the nurse-patient relationship', which is intended for showing to professional audiences only. It is a 16 mm. sound film in black and white and the running time is 34 minutes.

This film is produced by the American Nurses Association and National League for Nursing in cooperation with the Mental Health Education Unit of SKF Laboratories. It is designed to meet a specific need in psychiatric nursing education and emphasizes the importance of a therapeutic nurse/patient relationship in the care and treatment of the hospitalized mental patient. The film traces a developing relationship between a psychiatric nurse and one of many patients in her care. In following the frustrations as well as the achievements of a nurse in a typical state mental hospital situation, many of the basic techniques in psychiatric nursing are reviewed.

Although this film is intended primarily for showing to graduate nurses with some experience in psychiatric nursing, it should also serve as a valuable teaching aid at all levels of the nursing profession — from the experienced psychiatric nurse to the first year student at nursing school. It may also be of interest to resident physicians in psychiatry. An instructor's guide for this film is available.

Bookings for the film may be arranged through local SKF representatives or by writing to SKF Laboratories, P.O. Box 38, Isando, Transvaal. If possible, 4 weeks' prior notice and an alternative showing date of at least 1 month after the preferred date should be given.

VRAE BEANTWOORD : QUESTIONS ANSWERED

WEIGHT REDUCTION

Q—*Please describe a satisfactory weight-reducing regime which will be practical and acceptable to patients, with special reference to the following: Types and quantities of food (in terms of weight, size and caloric value of the particular foodstuffs), the use of drugs, and literature on the subject which could be used as a guide for patients?*

A—All cases of obesity can be explained by an excess of caloric intake over utilization. In order to reduce weight, this state of affairs must be reversed. Weight-reducing diets depend on limitation of calorie intake. While many varieties of diet exist, the one most likely to satisfy the patient is as follows:

1. Avoid excessive carbohydrates — e.g. bread, potatoes, rice, cakes, sweets, biscuits, sugar, jam, honey, spaghetti and other farinaceous foods.

2. Avoid very fatty foods. Meat and fish should be grilled, not roast or fried — eggs should be boiled or poached.

3. Abundant non-carbohydrate foods may be taken — e.g. fish, meat, eggs, green vegetables, salads, and non-fattening fruits (paw-paw, grapefruit, apple, pineapple).

On this diet the patient should not feel hungry, and should lose weight at a steady rate of 2 - 3 lb. a week. Because of its simple nature, the patient is more likely to adhere to this diet than to many other more esoteric and less satisfying diets.

Generally the use of drugs is unnecessary, but an occasional patient feels hungry and may need an anorexigenic aid. There are far too many of these agents on the market for an extensive list, but most contain or are related to amphetamine. This substance or 'dexedrine' (dexamphetamine) is widely used in doses of 5 - 10 mg. taken 1 hour before meals. Because of mental stimulation and possible insomnia, it is best to omit the evening dose.

Combinations of these agents with barbiturates or tranquillizing drugs are available to reduce excitation. Psychosis and habituation have been reported with both of these drugs. 'Preludin' (25 mg.), 'califon' (50 mg.) and 'tenuate' (diethylpropion) are similar appetite-reducing agents, used in the same way. Cellulose products have been used to create a 'filling' effect, but are not of much value. The use of any thyroid substance in the treatment of obesity is to be deplored, unless there is a good evidence of hypothyroidism.

Finally, mention must be made of psychological factors. Many obese patients crave food, as an alcoholic craves alcohol. Mere dietary restriction does not suffice, and the best results follow constant visits, discussions and exhortations with regular 'weigh-ins'. The intelligent patient may care to read *This Slimming Business*, by J. Yudkin and *Reduce and Stay Reduced*, by N. Joliffe.

Readers are invited to submit questions for this column to the Editor, *South African Medical Journal*, P.O. Box 643, Cape Town.

IN DIE VERBYGAAN : PASSING EVENTS

College of General Practitioners, Cape of Good Hope Faculty. On 12 and 13 November a team of specialists will visit Ladismith, Cape, to deliver a series of lectures, the Upjohn Travelling Lectures. Doctors wishing to attend the course should apply either to Dr. A. G. Blyth, P.O. Box 12, Ladismith, who is in charge of the arrangements and who will be pleased to supply further details; or to the Secretary, College of General Practitioners, P.O. Box 643, Cape Town, telephone 3-2022.

* * *

South African Institute for Medical Research, Johannesburg, Staff Scientific Meeting. The next meeting will be held on Monday 7 November at 5.10 p.m. in the Institute Lecture Theatre. Dr. J. W. F. Hampton, of the Virus Laboratories of the Poliomyelitis Research Foundation, will speak on 'Biophysical studies of the West Nile virus'.

* * *

South African Paediatric Association (M.A.S.A.), Cape Town Sub-Group. The next meeting of this Sub-Group will be held on Tuesday 1 November at 8.15 p.m. in the Lecture Theatre, Red Cross War Memorial Children's Hospital, Rondebosch, Cape. Mr. G. S. Muller Botha will speak on 'Surgical aspects of lung disease in childhood'. Visitors are welcome to attend this meeting.

* * *

Dr. Frank Walt returned to Durban on 5 October after visiting London and the USA where he attended various hospitals. While in Washington, D.C., Dr. Walt attended the Fifth International Congress on Nutrition and delivered a paper on 'The response of the anaemias of kwashiorkor to therapy'.

* * *

Dr. Fred Benjamin, M.D., M.R.C.O.G., gynaecologist and obstetrician, has resumed practice at the Park Drive Medical Centre, 110 Park Drive, Port Elizabeth. Telephones: Rooms 35756, residence 25298, if no reply 21545.

Dr. Fred Benjamin, M.D., M.R.C.O.G., ginekoloog en verloskundige, het sy praktyk hervat te Parkrylaan Mediese Sentrum, Parkrylaan 110, Port Elizabeth. Telefone: Spreekkamer 35756, woning 25298, indien geen antwoord 21545.

* * *

Manual on Alcoholism. A small supply of manuals on alcoholism are now available to interested members of the medical profession. The manual is published by the Committee on Alcoholism, Council on Mental Health of the American Medical Association, and is of great value to the doctor who meets with the problem of alcoholism in his practice. The contents of this concise guide include the medical treatment of alcoholism, physiology of alcohol, psychiatric treatment of the alcoholic, social settings conducive to alcoholism, a sociological approach to the medical problem, hospitalization of patients with alcoholism, classified abstract archive of the literature on alcoholism, and State information sources of alcoholism.

This booklet is strongly recommended to all doctors in medical practice and is available at a cost of 10s. per copy from the South African National Council on Alcoholism, P.O. Box 10134, Johannesburg. Telephone: 33-2748.

* * *

Milk said to Curb Strontium-90 Accumulation. Milk is still a most satisfactory protective food, regardless of concern about its strontium-90 content. In fact, a recent issue of *Nutrition Reviews*, published in the USA, reports that milk actually protects against strontium-90 accumulation in the bone. 'The reports released by the United States Public Health Service of gradually increasing levels of strontium-90 in milk have led to increasing concern on the part of both professional and lay persons', the journal says. But a survey by Dr. Bruce L. Larson, Assistant Professor of Biological Chemistry, Department of Dairy Science, University of Illinois, gives strong support to the claim that milk is still Man's most satisfactory food, not only in terms of nutrition, but in preventing strontium-90 accumulation in the bones.

The survey is reported in the *Journal of Dairy Science* in which Dr. Larson says evidence now indicates that people in the 'primary milk-consuming areas' have relatively lower levels of strontium-90 in their bones than people in the primary 'plant-consuming areas'. This is attributed to the high calcium level in milk. Dr. Larson says 'it may be just as wise to increase milk consumption as to try to remove the strontium-90 from milk'. — *New York Times.*

* * *

Research Forum, University of Cape Town. The next meeting of Research Forum will be held on Wednesday 2 November at 12 noon in the Bennie de Wet Lecture Theatre, A-floor, Groote Schuur Hospital, Observatory, Cape. Dr. J. B. Herman will speak on 'Remissions in diabetes: A long-term study'. All who are interested are invited to attend this lecture.

* * *

Drs. H. J. Besselaar, C. A. R. Schulenburg, H. Aneck-Hahn and Jan Lion-Cachet have moved to new premises at 516 van Riebeek Medical Buildings, Schoeman Street, Pretoria. Their telephone numbers will remain unchanged and are 23007, 32841, 25835 and 32040 respectively.

* * *

University of Cape Town and Association of Surgeons of South Africa (M.A.S.A.), Joint Lectures. The next lecture in this series will be held on Wednesday 2 November at 5.30 p.m. in the E-floor Lecture Theatre, Groote Schuur Hospital, Observatory, Cape. Mr. W. Silber will speak on 'Heartburn'. All members of the Medical Association are welcome to attend this lecture.

NUWE PREPARATE EN TOESTELLE : NEW PREPARATIONS AND APPLIANCES

DELTA-BUTAZOLIDIN

J. R. Geigy S.A. Basle, introduce Delta-Butazolidin and supply the following information:

Delta-Butazolidin is a combination of Butazolidin 50 mg. and prednisone 1·25 mg. In both the laboratory and the clinic it has been shown that the anti-inflammatory analgesic and antipyretic properties of the two components reinforce each other, thus being synergistic. Butazolidin retards the metabolism of prednisone and it is due to this fact that the potential hormone effect seen with the composite preparation can probably be described. Due to these factors lower dosage of each component can be given and better toleration with minimization of risk of hormonal imbalance results. The serious side-effects normally associated with hormonal therapy alone have not yet been observed with this drug. Because of low dosage and consequent excellent toleration this drug is specifically indicated in the treatment of acute and chronic rheumatic conditions where the use of corticosteroids has hitherto been preferred. Also, it is indicated where one or other of the two components have not proved satisfactory. Butazolidin alone is still recommended for the initial treatment of all acute and chronic rheumatic affections.

Dosage. Initial dosage: in general 2 tablets 3 or 4 times a day. This dosage should usually be maintained until the first distinct subjective and objective signs of improvement are observed. Maintenance dosage: 2 tablets twice a day, or 1 tablet 3 times a day will suffice in the majority of cases.

Delta-Butazolidin is supplied in containers of 30 and 150 tablets.

Further information may be obtained from Pharmakers (Pty.) Ltd., P.O. Box 4125, Cape Town.

ANATENSOL

Squibb Laboratories (Pty.) Ltd. introduce Anatensol, Squibb fluphenazine dihydrochloride, and supply tthe following information:

Synthesis of a new orally-administered drug that relieves anxiety and tension without clouding consciousness has been announced by Squibb International of Olin Mathieson Chemical Corporation.

The development by the Squibb Institute for Medical

Research of this phenothiazine derivative, known generically as fluphenazine, is the culmination of extensive research for a tranquillizer, suitable for the treatment of symptoms of anxiety and tension, commonly seen by the general practitioner, particularly in ambulant patients. The Institute is located in New Brunswick, New Jersey, USA. The new preparation is sold under the trade name Anatensol. It is also sold in other countries under different trade names, and is known in the United States as Prolixin. Anatensol is now fully available in South Africa.

Chemical structure. Chemically, it is designated as 4- { 3-[(2-trifluoromethyl) - 10 - phenothiazinyl] propyl } - 1 - piperazine-ethanol. Anatensol has been tested by clinical investigators in the form of dihydrochloride.

Mental alertness maintained. One of the difficulties encountered with previously available tranquillizers, according to a Squibb spokesman, is that they over-sedate and tend to interfere with the ambulant patient's everyday activities. Anatensol, according to clinical reports received to date, lessens anxiety and tension but seldom impairs mental alertness and acuity when used at the recommended dosage. Comparing it with other phenothiazine derivatives, one investigator reported that fluphenazine 'mitigates apathy, indifference, inertia and anxiety-induced fatigue' and 'increases efficiency by facilitating psychic relaxation'.

Action. Site and mode of action have not been determined. The pharmacologic actions of Anatensol are tranquillizing and anti-emetic.

Indications. Anatensol is effective in anxiety and tension, both in the ambulatory and the bed patient. It has proved effective in disabling anxiety and tension states manifested by such symptoms as apprehension, restlessness, irritability, insomnia, nausea and vomiting where no organic disease was evident, and in anxiety and tension associated with somatic conditions such as hypertension and cardiovascular disease.

Administration. Oral.

Side-effects. In the recommended daily dosage Anatensol has rarely produced undesirable side-effects.

Contra-indications and precautions. Because of its potentiating effect, Anatensol should not be used in patients given large doses of hypnotics or in severely depressed patients. As with other phenothiazine drugs, it should be administered with caution to patients with a history of convulsive disorders. It should also be used with care when dosages exceeding the recommended ones are employed.

Dosage. In anxiety and tension, the recommended dose for adults is 1 mg. daily. If necessary, the total daily dose may be increased to 1 mg. *b.i.d.* or 2 1-mg. tablets given as a single dose in patients with relatively severe symptoms who have tried the lower dosage. A daily dose in excess of 2 mg. should be used with caution.

Supply. Anatensol is supplied in bottles of 25 tablets of 1 mg.

Further information may be obtained from Squibb Laboratories (Pty.) Ltd., P.O. Box 9975, Johannesburg. See also advertisement on pp. xvi and xvii.

BOEKBESPREKINGS : BOOK REVIEWS

MEDICAL RESEARCH

Significant Trends in Medical Research. A Ciba Foundation Tenth Anniversary Symposium. Edited by G. E. W. Wolstenholme, *O.B.E.*, M.A., M.B., M.R.C.P., Cecilia M. O'Connor, B.Sc. and Maeve O'Connor, B.A. Pp. xii + 356. 41 illustrations. 50s. net. London: J. & A. Churchill Ltd. 1959.

This is a very fascinating book. Most of it is comparatively easy to read, wide in its scope, and chock full of interesting ideas and suggestions. As with most of the Ciba publications, the discussions are often more interesting than the set lectures themselves. The vast range of subjects which is considered is evident from the titles of the chapters, and the standard seems to your reviewer to be equally high throughout, as indeed might be expected from such a distinguished company. The chapters are as follows:

Chairman's opening remarks by Sir Harold Himsworth; Molecular structure in relation to biology and medicine by L. Pauling; Fluorimetric studies on pyridine-nucleotide enzyme complexes by H. Theorell; Chemical basis of virus multiplication by G. Schramm; Population dynamics of body cells by Sir Macfarlane Burnet; Genetics and medicine by J. Waldenström; Ten years of general neurophysiology by A. von Muralt; The nature and mechanism of action of hormones by F. G. Young; Metabolic problems involving the pancreas, choline, insulin and glucagon by C. H. Best; Research in chronic pulmonary disease by D. W. Richards; Malignant transformation: its mechanisms and nature by A. Haddow; Research in clinical nutrition by J. F. Brock; The quantitative approach to disease — exemplified by essential hypertension by Sir George Pickering; Factors influencing the substance and dimension of medical research in the United States by J. A. Shannon; General discussion by Brain, Himsworth, Loeb, McMichael, Pickering, Shannon, Waddington, Young; Chairman's closing remarks by Sir Harold Himsworth.

I found the most intriguing contributions to be those of Burnet, who discussed certain aspects of his clonal theory; Waldenstrom, who talked about genetics in medicine with special regard to porphyria and globulins; and Young, who considered the nature of hormones. But other readers will like other chapters, and certainly it was a great pleasure to see South Africa's contribution — Professor Brock's so clear enunciation of the present position of research on kwashiorkor, largely that of his own unit.

Altogether a very suitable work with which to celebrate the tenth anniversary of the Ciba Foundation.

W.P.U.J.

THE NATURE OF DISEASE

A Final Study in the Nature of Disease. By J. E. R. McDonagh, F.R.C.S. Pp. xx + 376. 30s. net. London: William Heinemann Medical Books Ltd. 1959.

The reader must be careful when he encounters new ideas not to discard them offhand simply because they do not conform to accepted thought. When the germ theory of infective disease was first published it met with sturdy opposition. A similar fate might befall other 'break-throughs' (as the journalists call them) in medicine. I have read Dr. McDonagh's theory of disease, and its application to individual diseases, with care. But to me it does not make sense. The author fails to give demonstrable proof of his theory, nor is it expounded by clear and reasoned argument. I reproduce here, verbatim, from the Introduction, the kernel of the matter. The reader can judge for himself:

'The fundamental conclusions are five in number. The first is that every mass and ray in the universe either has been, or continues to be, a product of the condensation of "activity".

'The second is that the least condensed of the have-been products form the basis of "climate".

'The third is that this "climate" penetrates every current product and releases "activity" from where it is stored in the product.

'The fourth is that the released "activity" describes cycles in the product in the course of which "activity" is liberated from and lost to the product, radiated, attracted and stored in the product; and, in the process of which the product expands and contracts, or pulsates.

'The fifth is that owing to the way in which these pulsatory cycles come to be described in the products, each is rendered divisible into three portions, the store, radiant, and attractive; and, its behaviour reducible to the exhibition of the three functions of "activity". These functions of radiation, attraction and storing derive their names from the portions, which are involved in their exhibition.

'In order to complete these fundamental conclusions I should have been able to describe the nature of "activity". But this I cannot do and I doubt whether, what must always have been and still remains the greatest problem facing inquiring man, will ever be able to be solved. All I can say on the subject, is that "activity" is the primordial material, out of which I imagine every mass and ray in the universe to have been and to continue to be being fashioned. I picture this "activity" as

describing a spiral, in the course of which the products of its condensation are being generated. This spiral is divisible into pre- and post-colloid parts, and each part into sections; the pre-colloid part into the atomic and crystalline sections, and the post-colloid part into the colloid, vegetable and animal sections. The main differences between the pre- and post-colloid parts are that in the description of the pulsatory cycles in the former only one function of "activity" is exhibited at a time; and, that the condensation the product undergoes may occur either at a higher or at a lower level. When condensation occurs at a higher level the product may be said to progress, and at a lower level to retrogress. In the description of the pulsatory cycles in the post-colloid products, all three functions of "activity" are exhibited at the same time. The condensation the products undergo may occur at the same two levels; but, from the birth of protein onwards, which I arbitrarily fix to be the last product to have been generated in the colloid section, the words "progress" and "regress" may be replaced by "health", or "life", and "disease" and "death". F.F.

ANTISTOL-TERAPIE

Antithrombotic Therapy. By P. W. Boyles, M.D. Pp. vii + 131. 24 figures. $5·00. New York and London: Grune & Stratton, Inc. 1959.

Daar is definitiewe indikasies vir antistol-terapie en die langtermyn gebruik daarvan wen meer en meer veld. Dit is dus noodsaaklik dat alle geneeshere 'n redelike begrip het van die indikasies en die gevare verbonde aan die gebruik van antistol-middels.

In hierdie monografie poog die skrywer om so kort moontlik die belangrike punte in verband met die stol-meganismes van bloed en die beginsels van die verskillende laboratoriumtoetse vir die bepaling daarvan, te bespreek.

Die kliniese indikasies en gebruike van die verskillende antistol-middels word ook uiteengesit, insluitende die gebruik van die middels oor 'n lang tydperk.

Die huidige stand van die relatief nuwer trombolitiese terapie word ook bespreek.

In die addendum gee die skrywer 'n lys van die sinonieme van die verskillende bloedstollingsfaktore, asook beskrywings van hoe die verskillende toetse en laboratoriumbepalings van die ondersoek van die stollingsmeganisme, gedoen word.

Die boekie is verreweg nie 'n volledige beskrywing van die onderwerp nie, maar dit was dan ook nie die doel nie. Die belangrike punte word kort en op 'n maklik-verstaanbare manier beskryf. Die boek kan aanbeveel word veral vir algemene praktisyns en andere wat nie direk met die beheer van die antistol-proses te doen het nie, maar wat wel pasiënte daarvoor verwys. Studente sal die boek ook nuttig en leersaam vind. M.A.dK.

GEDRAGSVERANDERINGE IN DIE KLINIEK

Behavioral Change in the Clinic — A Systematic Approach. By Gerald R. Pascal, Ph.D. Pp. viii + 128. $4·75. New York and London: Grune & Stratton, Inc. 1959.

Die skrywer, wat 'n kliniese sielkundige is, behandel die belangrikste sielkundige faktore — prikkels, spanning, gewoontehandeling, omgewing — wat gedrag beïnvloed, en veral die verandering van gedrag deur psigoterapie. Hy probeer om met behulp van algebraïese formules die relatiewe waarde van hierdie veranderlikes in die gedrag van die persoon aan te toon. Sy hoofdoel is om die kliniese metode, en veral psigoterapie, op eksperimenteel-wetenskaplike gronde te regverdig. Allesins 'n lesenswaardige en baie interessante verhandeling, wat vir die medikus sowel as vir die sielkundige insiggewend kan wees. A.B.vdM.

BRIEWERUBRIEK : CORRESPONDENCE

TEKORT AAN DERMATOLOË

Aan die Redakteur: Sal u my asseblief die geleentheid gun om in u *Tydskrif* 'n beroep te doen op sommige van ons kollegas? Ek wil graag aan daardie kollegas, insluitende huisdokters, wat dermatoloë wil word, vra om met my in aanraking te tree.

Elke jaar is daar in ons land 'n groter aanvraag na jong spesialiste met 'n moderne opleiding in dermatologie. Daar bestaan tans aansienlike geleenthede vir hulle en hierdie geleenthede sal bly voortbestaan vir 'n onafsienbare tydperk.

In 'n oorsig wat deur die Departement van Onderwys gepubliseer is, was ons verbaas en aangenaam verras om te sien dat daar ten minste 26 Suid-Afrikaanse geneeshere is wat graag dermatoloë wil word. Ons sou graag van hierdie mense wou verneem, en terselfdertyd ook van enigiemand anders met soortgelyke strewes.

Selfs die persone wat nog besluiteloos is, is veral welkom om met my in aanraking te tree, indien ons vir hulle van enige hulp mag wees. Die Dermatologiese-Groep beskou dit as een van hulle belangrikste funksies om inligting en aanmoediging te verskaf en op hierdie manier verdienstelike kollegas tot hulle geledere te werf.

G. H. Findlay
Voorsitter, Dermatologiese Sub-Groep, (M.V.S.A.)

Mediese Sentrum 528
Pretoriusstraat
Pretoria
1 Oktober 1960

DOCTOR TO DOCTOR OR THE PROBLEM OF REWARD

To the Editor: One of the few privileges left to us, and probably the finest, is to be able to treat our colleagues. I must agree with *Medicus*[1] that the high ideals to which our profession adhered until the beginning of this century, in many instances have had to be cast aside under the commercial pressures of our practices. I have never looked upon medical practice as a means to a financial end. It would have been foolish since the enormous cost of training, time and interest, if applied to ventures in commerce or industry (rather than to becoming a doctor), would undoubtedly have carried much greater reward. On the other hand, I never hesitated to instruct my lawyer to collect fees when I knew that my patient always seemed to find money for small luxuries, a motor car, the cinema and the bottle store, but not for my account.

Soon after I commenced private practice, a colleague suffered the mental and physical agony of a coronary thrombosis. For a good 4 weeks I saw him daily and nothing has given me greater satisfaction in my medical career than to see him recover and return to his rooms. At that time I borrowed money to pay for my petrol and the rent of my rooms. From him I received no more than an unmistakable look of gratitude. There was no letter of thanks, no bottle of whisky, no silver knick-knack to embarrass me.

My family and I have on rare occasions had the privilege of treatment by a colleague and it was wonderful to feel that these colleagues did for me what I would do for them without unnecessary embarrassment derived from presents. The idea of financial reward would have been as repugnant to them as it is to me.

There has been an obvious and necessary move in the direction of a change towards a more realistic attitude in the doctor-patient relationship when it concerns the payment of fees and I, for one, would welcome the apparently old-fashioned idea that the patient should pay his doctor immediately after consultation or treatment. The entire set-up of credit and accountancy in medical practice is unrealistic and should be abolished by law, if I could have my way. All of us would then know immediately when we work *pro Deo* and the decision to do so would rest with us rather than with often irresponsible patients. When, however, it comes to treating my brother doctor, I consider it a great privilege to be able to do so, not *pro Deo* but for my own self-esteem.

We serve, and if we are allowed to choose whom we serve for service's sake, I would choose my own profession and their families. In this choice lies my reward. Let us not abandon this noble privilege.

Colleague

Johannesburg
18 October 1960

1. Correspondence (1960): S. Afr. Med. J., **34**, 900 (15 October).